

**The Walter and Eliza Hall
Institute of Research
in Pathology and
Medicine,**

MELBOURNE HOSPITAL.

DIRECTORS' REPORT, 1920.

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THE WALTER AND ELIZA HALL INSTITUTE OF RESEARCH IN PATHOLOGY AND MEDICINE.

The following is the annual report for 1920 presented by the Director of The Walter and Eliza Hall Institute of Research in Pathology and Medicine to the Board of the Institute on December 22, 1920.

Director's Report.

The bacteriological, bio-chemical, histological and serological departments of the Institute have been equipped and are in full working order; the department of experimental pathology is not yet completed, however, owing to delay in delivery of kymographs and other heavy apparatus ordered in England.

Dr. H. Hume Turnbull has lent his electro-cardiographic apparatus for research work and this is being installed in the Institute. Mr. A. E. T. Payne has placed his micro-photographic equipment at the disposal of the Institute and it is now in use for recording the work. The trustees of the late Dr. G. C. M. Mathison have presented his collection of scientific books and reprints to the Institute and these are being catalogued to form the nucleus of a reference library.

RESEARCHES.

It was decided that the Institute should devote special attention to two main researches: (i.) the various problems of hydatid infestation of man, since echinococcosis is still widely endemic in the southern States of Australia; and (ii.) an investigation into the incidence and ætiology of acute respiratory infections, interest in which had been greatly stimulated by the occurrence of pneumonic influenza.

Hydatid.

Dr. Hamilton Fairley has undertaken an investigation of the value of the complement fixation reaction in echinococcal infections, a method which has been used considerably in Europe (Guedini, Weinberg and others), but has not hitherto been successfully applied to the diagnosis of hydatid diseases by Australian workers. Preliminary experiments were made to determine the most suitable hydatid antigen and the best method of its standardization. A series of 480 cases from Victoria, South Australia and New South Wales was investigated. Fifty-three patients suffered from hydatid disease; of these, forty-seven (89%) gave positive serological reactions. No patient other than those affected with hydatid infestation yielded positive results. The diagnostic value of the reaction in clinical medicine has therefore been fully confirmed.

An even more important aspect is the value of the test in prognosis. Observations by the workers in the Institute indicate that the reaction disappears within three months of a successful operation, unless a second cyst be present. If future results confirm this, the test will afford much valuable information to the surgeon in indicating whether the infestation is of multiple or single type.

These results were briefly reviewed in a paper by Dr. Fairley entitled "Observations on the Immunity Response in Helminthiasis, and Reflections Regarding treatment," read before the Section of Pathology of the Australasian Medical Congress, Brisbane, 1920.

In a few hospital patients with hydatid disease the therapeutic value of tartar emetic given intravenously has been investigated. The results have been disappointing. No alteration of positive serological reactions has resulted and no evidence has been obtained that tartar emetic traverses the adventitia and reaches the encapsulated parasite. The administration of 1.5 grm. (25 grains) of the drug failed to produce any evidence of degeneration in the cyst demonstrable at operation.

Work is being continued on these lines and the scope of the research is being extended to include the experimental pathology of hydatid infections.

Pneumonia.

Dr. S. W. Patterson and Miss F. E. Williams have carried out a series of observations on the bacteriology of acute respiratory diseases in Victoria. They have made cultures from the lungs and bronchi of 324 persons examined *post mortem* and are correlating the germs recovered with the nature of the lung condition found to be present. Special attention has been paid to the cultural characteristics of the pneumococci and allied germs; their bio-chemical reactions and serological types, according to the American classification with Mulford sera, have been examined. They have also prepared type sera by immunizing Australian wild rabbits and are engaged in classifying the pneumococcus group of bacteria occurring in Australia. By these methods, the germs found in the sputum of 143 persons suffering from pneumonia and broncho-pneumonia have been classified. A preliminary account of the results obtained was contributed to the discussion on pneumococci in the Section of Pathology of the Australasian Medical Congress, Brisbane, 1920.

Protozoal Diseases.

Owing to the danger of the introduction of new disease into Australia by returned members of the Australian Imperial Force, it was decided to continue in the Institute the study of certain protozoal and helminthic diseases commonly encountered in the near east. Dr. Hamilton Fairley and Mr. H. R. Dew have commenced a series of studies on malaria, the dysenteries and the pathology of human bilharziosis. The first conjoint paper was based on "Observations on the Clinical and Applied Pathology of Malarial Infections" and was read before the combined Sections of Naval and Military Medicine and Surgery and of Pathology of the Australasian Medical Congress.

Another paper based on an analysis of 1817 cases of dysentery or suspected dysentery observed in Egypt, has just been completed. It emphasizes particularly the necessity for re-investigating with modern bacteriological methods the colitis of adults and the ileo-colitis of infants from the standpoint of bacillary infection.

A detailed investigation of the pathology of human bilharziosis (*B. mansoni* and *B. hæmatobia*) is now being

made. The observations on the morbid anatomy are based on *post mortem* examinations of 250 cases of urinary and intestinal bilharziosis. Material for microscopic examination was derived from 50 selected cases and the 150 blocks of tissue which were brought from Egypt, are affording abundant scope for study of the more delicate pathological features of these diseases. The results completely verify the observations on experimental bilharziosis already published. The completed work should constitute a most detailed study of the pathology of bilharziosis.

Wassermann Reaction.

A certain amount of experimental work has been carried out in regard to the Wassermann reaction by Dr. Fairley. A serological examination of 1,707 hospital patients suspected of syphilis has been made, the Harrison technique being used. The majority of the tests have also been carried out by the ice-box method and a comparison of the results made. The clinicians and staff of the hospital have supplied accurate clinical data regarding the cases and throughout the series there has been a remarkable uniformity of results. At least 99% of all the cases which were clinically syphilitic, have yielded positive Wassermann reactions.

The proportion of patients in a general hospital with serum yielding a positive Wassermann reaction who die at a later stage and are subject to *post mortem* examination, is high (33% in the series of 148 cases); the opportunities for examining the results of long-standing syphilitic infection on the various organs of the body are numerous. Dr. W. W. S. Johnston and Dr. Patterson are carrying out an investigation of syphilitic aortitis and have examined 148 persons *post mortem*, correlating the macroscopic and microscopic appearances with the results of the Wassermann test.

Cancer Research.

Dr. P. A. Stevens has been working in the Institute since April under the terms of the John Grice Cancer Research Scholarship. He has undertaken the investigation and recording of cases of malignant diseases occurring in the Melbourne and Austin Hospitals. A series of 62 cases of epithelioma of the lip was examined and the results were embodied in a paper published in *The Medical Journal of Australia*.¹ A case of long-standing nasal polypi sent to the Austin Hospital as sarcoma of the nose was as the result of investigation dealt with at the Melbourne Hospital and cured by operative treatment.² Dr. Stevens and Dr. R. Wettenhall are working on the action of X-rays on the skin. Dogs and guinea-pigs are being used in these experiments. The results are as yet incomplete, but should throw some light upon the effect of X-ray therapy in malignant cases.

Six reports have been sent to the Cancer Research Committee of the Melbourne University, embodying the work done during the past nine months.

Clinical Research.

Dr. H. F. Maudsley, Clinical Research Scholar, has been working on the clinical side of the pneumonia investiga-

tion and has made observations on the degree of leucocytosis as a guide to prognosis and on the Arneth count in various grades of severity of pneumococcal infection. With a view to determining the occurrence of shock as a factor in the mortality of pneumonia, observations have also been made on the hæmoglobin content of venous and capillary blood in these cases.

Intestinal Infections.

During the past year Dr. Patterson has been investigating the bacteriology of gall-bladder infections. He has also worked with Miss Williams on cases of enteritis and colitis occurring in the hospital and in the practice of medical men interested. Already results are being obtained pointing to a considerable amount of true dysentery amongst these patients; the Flexner-Y group of dysentery bacilli occurring in Melbourne is being investigated and classified serologically.

References.

- (1) *Med. Jour. of Australia*, Nov. 20, 1920.
- (2) *Med. Jour. of Australia*, Dec. 12, 1920.